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ABSTRACT

The mysterious darkness of Mammoth Cave in southwestern Kentucky, about 90 miles south of Louisville and 90 miles north of Nashville, has lured travelers to enter and warned them to stay away. From the dawn of time visitors have been awestruck by the cave's size and rugged beauty. This lesson is based on the National Register of Historic Places registration file "Mammoth Cave National Park" and an associated historic resource study. The lesson can be used in U.S. history units on the development of the national parks or the expansion of tourism in the 1920s and 1930s, and in ecology, geology, or other science courses that deal with natural phenomena. Following an explanatory introduction ("About This Lesson") which also lists objectives and materials for students, the lesson is divided into six sections: "Setting the Stage: Historical Context"; "Locating the Site: Maps" (Mammoth Cave National Park and Surrounding Region; Mammoth Cave, 1845; Modern Map of Mammoth Cave); "Determining the Facts: Readings" (The First Explorers; Mammoth Cave Becomes a World-Famous Attraction; For Future Generations); "Visual Evidence: Images" (Cross Section through Mammoth Cave; Saltpeter Mining Operation; Modern View of Green River Valley; Farm Field, c. 1935; Visitors Pose with Guide, c. 1900; Modern Day Visitors in a Cave Passageway); "Putting It All Together: Activities" (Touring Mammoth Cave; Caring for Local Resources; Luring the Public to a Special Place); and "Supplementary Resources." (BT)

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Teaching with Historic Places

# Mammoth Cave: It's Explorers, Miners, Archeologists, and Visitors

Teaching with Historic Places
National Register of Historic Places
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# Mammoth Cave: It's Explorers, Miners, Archeologists, and Visitors

*(Mammoth Cave National Park)*

Along the banks of the winding Green River, newly fallen leaves rustle as a man walks from his camp toward the high bluffs. Pausing to gaze back into the deep river valley and then upward into the sunlight sparkling on the crimson and golden leaves still clinging to their summer hosts, he thinks about the great darkness that lies just ahead beneath the forest floor. He has journeyed there many times since he was a young man. Around campfires he often listened to the stories of the old people who journeyed into the darkness. Now he himself is old. Perhaps this winter he will tell his own tales about the great cave that opens directly beneath his feet.

The mysterious darkness of Mammoth Cave in southwestern Kentucky has both lured travelers to enter and warned them to stay away. Some entered and never returned. Most entered and came back to tell of their experiences in the dark, silent, and mysterious cave. From the dawn of time visitors have been awestruck by the cave's size and its rugged beauty.

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**This lesson is based on Mammoth Cave National Park, one of the thousands of properties and districts listed in the National Register of Historic Places.**

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# About This Lesson

This lesson is based on the National Register of Historic Places registration file, "Mammoth Cave National Park," and an associated historic resource study. It was written by Robert H. Ward, a Historian at Mammoth Cave National Park. It was edited by Fay Metcalf and the Teaching with Historic Places staff.

**Where it fits into the curriculum**

**Topics:** This lesson could be used in U.S. history course units on the development of the national parks or the expansion of tourism in the 1920s and 1930s, and in ecology, geology, or other science courses that deal with natural phenomena.

**Time period:** Pre-Colonial through Modern America.

**Objectives for students**

1) To describe how Mammoth Cave was formed and how it remains dependent on water.

2) To compare the experiences of travelers who visited the cave over several time periods

3) To list and describe several ways the cave's resources have been used.

4) To discover a site in their local community that should be considered for protection.

**Materials for students**

The materials listed below either can be used directly on the computer or can be printed out, photocopied, and distributed to students.

1) three maps Mammoth Cave National Park and the surrounding area;

2) three readings that describe major events associated with the cave;

3) one diagram and one drawing of a cross section through Mammoth Cave and the Saltpeter mining operation;

4) four photos of the park and its visitors.

**Visiting the site**

Mammoth Cave National Park is located approximately 90 miles south of Louisville, Kentucky, and 90 miles north of Nashville, Tennessee, just west of Interstate 65. The park is open all year and cave tours are offered every day except December 25. For more information, write the Superintendent, Mammoth Cave National Park, Mammoth Cave, KY 42259 or visit the park's Web page at http://www.nps.gov/maca/

# Getting Started
# Inquiry Question

**What appears to be happening in this drawing?**

# Setting the Stage

Mammoth Cave enjoys the distinction of being the longest cave in the world, with more than 345 miles of explored passageways. In 1981 the United Nations Educational Scientific & Cultural Organization (UNESCO) recognized it as a World Heritage Site and in 1990 as an International Biosphere Reserve. The cave is particularly interesting because the processes that formed it in the first place are continuing. Passageways are being carved out today in the same way as they have been for more than a million years.

Mammoth Cave National Park's surface area of 52,830 acres is characterized by rugged forested hills, high rocky bluffs, and two major rivers, the Green and the Nolin. This serene and largely unpopulated natural setting in Kentucky belies the long and colorful history of the area. Mammoth Cave is the centerpiece of one of the greatest cave regions in the world. The Mammoth Cave area includes numerous deep cracks, sinkholes, underground streams, and layers of limestone rock. These rock layers are eroded and dissolved by underground water. The water drains underground through vertical cracks and horizontally between layers of limestone and eventually forms sinkholes and caves. The resulting landscape, created by the action of water, is known as a karst landscape. Underground water has carved out Mammoth Cave in long, horizontal passageways over the past several million years. The upper passages, dry today, were hollowed out millions of years ago; the lower passages are still being enlarged by the flowing waters of Echo River and several other underground streams. Mammoth Cave's huge vertical shafts, called pits and domes, have been created by groundwater seeping downward through sinkholes or cracks located beyond the edge of the protective hard layer of sandstone that overlies much of the cave.

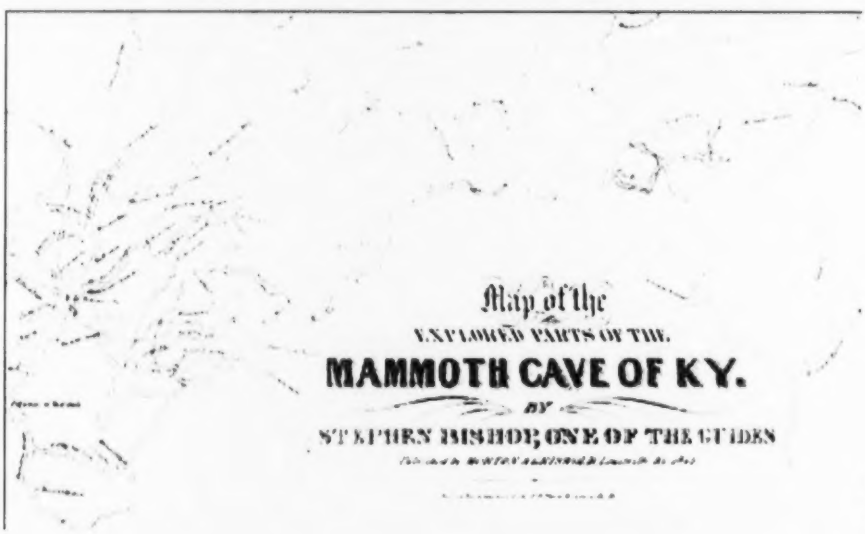
Water also has been essential in decorating parts of the cave with gypsum formations, stalactites, stalagmites, draperies and flowstone. The delicate gypsum formations occur in some of the cave's drier chambers; the rest of the formations appear in some of the wetter chambers.

Water is also vital to the unusual biota, or animal and plant life, of the region. Above ground and in the cave there are approximately 1,000 kinds of plants and about 500 types of animals. The cave itself abounds with unusual fish, shrimp, crayfish, crickets, spiders, beetles, molds, and mushrooms that live within its cool darkness. Many cave animals, like the blindfish and certain crickets, are blind. Some do not even have eyes. Other animal and plant life lack skin pigments and appear to be entirely white. Both the sightless and the colorless creatures would be unable to survive in the surface environment. They depend in the clean water of unpolluted underground streams to carry their food to them.

Geologists, zoologists, ecologists, archeologists, historians, spelunkers, and ordinary citizens are amazed and thrilled by the size, complexity of history, and environment of Mammoth Cave.

# Locating the Site
# Map 1: Mammoth Cave National Park and surrounding region.

# Map 2: Portion of a map drawn by guide Stephen Bishop, 1845.




(Courtesy of the Cave Research Foundation)

# Map 3: A modern map of underground trails in Mammoth Cave National Park

**Questions for Maps 1- 3**

1. Using Map 1, note the location of Mammoth Cave National Park within the state of Kentucky.

2. Map 2 was drawn by Stephen Bishop, a slave and famous Mammoth Cave explorer. Many similar maps have been drawn through the years as people continue to discover previously unknown passages. How would one go about exploring and mapping passageways that twist, turn back on themselves, and continually change levels? What problems do you expect Bishop encountered in drawing his map of the cave? Would you like to use this map if you were going to tour the cave? Why or why not? What is missing that would be important to know?

3. Study Map 3. What features can you find on both Maps 2 and 3? What do you think was the origin of some of the names given to areas of the cave? Why would it be important to assign names to various features and segments of the cave? Why is Map 3 easier to read than Map 2? Which map would be most useful and interesting for a tourist? a spelunker? a historian?

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# Determining the Facts
# Reading 1: The First Explorers

Arriving at the mouth of the great cave, a group of people begin a cautious descent into the mysterious darkness. For torches they carry flaming bundles made from cane reeds that have been gathered from the banks of the river and dried in the sun. As they move downward, their faces are brushed by the cool rush of air that comes from deep within the cave. Their torchlights flicker from the breeze. Sharp rocks on the cave floor push through their thin fiber sandals and grab at their feet. But they press steadily on, downward into the darkness.

Crouching as they proceed through a low passageway, they suddenly emerge into a great chamber, one so large that their torchlight does not reach across it. From this great chamber they walk through a large, arching tunnel of stone. The dancing orange light from their torches makes the cave walls seem to move like animals, but they have been followed into the cave only by their own shadows.

Up ahead, faint at first, then bright like stars in the nighttime sky, little rays of light twinkle from a high ledge near the ceiling of the great cave. One man climbs up onto a treacherous ledge to try to find the source of these twinkling lights. He crouches and sticks his torches into the soft dirt. Then he gets down on his knees and leans forward to use his digging stick to scratch into the cave dirt. He works slowly at first, and then faster and faster. Just beneath an overhanging boulder that leans toward the cave's ceiling, he has found the source of the twinkling lights. He has uncovered the beautiful minerals that will attract many generations of people to the cave. As he uncovers the small rocks from the dirt, he hears his companions call out to him from below.

Suddenly he feels a great weight pressing against his back; he cannot move his shoulder. The cool dampness of the cave soil presses against his face. In an instant his light is gone and there is only darkness around him. He does not hear the shouts of his companions below, as they watch helplessly as a large boulder falls and pins him to the ledge entombing him in the soft cave soil.

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Many centuries later, two men crawl and climb along a rock strewn ledge near the ceiling of the cave. They move cautiously so they will not fall to the cave floor below. Tour guides for many years, both are veterans at moving around in the cave. One of the men decides to go around a large boulder, but slips for a moment, catching his balance by putting his hand down to steady himself. He has done this dozens of times before. This time, however, something feels different. Rather than the usual rough and jagged surface of the ledges, he feels something smooth and rounded. He calls his companion to come and look. To the amazement of the two guides, the dim light of their kerosene

lanterns reveals the faint outline of the top of a man's head sticking out from beneath the large boulder. Quickly the men leave the cave to find others, including archeologists, to come and see their discovery.

That year, 1935, proved to be one of the most exciting years for archeological research in Mammoth Cave's history. The two guides, Lyman Cutliff and Grover Campbell, had found what archeologists would determine was the well-preserved body of a man who had visited the cave almost 2,000 years before. Their studies indicated that the man had indeed been on the ledge looking for something when he was trapped beneath the large boulder. With the help of the Civilian Conservation Corps, archeologists lifted the heavy boulder with ropes and pulleys, and revealed the body. The physical evidence showed that the man belonged to a group of people archeologists refer to as "Early Woodland"--a people who hunted game and gathered wild foods in the eastern woodland forests. They were also the first farmers in the Green River Valley, experimenting with growing gourds and sunflowers. Their artifacts, including cane reed torches, digging sticks, and sandals made from vegetable fibers "twined" together, have been found in many parts of Mammoth Cave.

Archeologists believe these first explorers probed deep into the cave to collect minerals such as gypsum which formed in the drier passageways. Why would they take such risks to collect minerals? Perhaps to use them in religious ceremonies or to trade to other groups. Perhaps the idea of collecting the sparkling minerals from beneath the earth made them especially valuable. The complete answer to this and other questions lies still buried deep in the darkness of Mammoth Cave.

**Questions for Reading 1**

1. How does the reading help you to identify with the first groups of explorers of Mammoth Cave?

2. What type of lights did these explorers use and how did they get the material to make them?

3. What were some of the sensations and emotions these people may have felt as they entered the cave?

4. Why do you think that people first went into the cave? What do you think it would be like to be an explorer with only the simple tools and equipment of these first explorers?

5. What product was found in the cave that can tell us about why prehistoric people pursued their explorations of Mammoth Cave?

*Reading 1 was compiled from Alonzo W. Pond, Lost John of Mummy Ledge (New York: The American Museum of Natural History, 1937); and Kenneth B. Tankersley, Patrick J. and Cheryl Ann Munson, and Patty Jo Watson, "Prehistoric Selenite and Satinspar Mining in the Mammoth Cave System, Kentucky," Midcontinental Journal of Archaeology 14, no. 2 (Kent State University Press, 1989), 119.*

# Determining the Facts
# Reading 2: Mammoth Cave Becomes a World-Famous Attraction

**Gunpowder and Slave Miners**

When the first European settlers entered the Green River Valley in the early 1790s, Kentucky was still a part of the state of Virginia. Mammoth Cave lay unknown to these early settlers, its entrance only one of many openings in the green hillsides surrounding the river. Then in 1799 a tract of 200 acres along the Green River was surveyed and found to contain two caves described as saltpeter caves. Saltpeter is a mineral that can be obtained by leaching sediments with water (see Drawing 1), much like when water is poured over coffee grounds to make coffee. Mining saltpeter was an important activity on the frontier because it was a key ingredient in gunpowder, and the early settlers needed their guns to hunt game for food and to defend themselves against possible attackers.

During the War of 1812 between the United States and Great Britain, much of the large quantity of saltpeter needed to fight the war was mined at Mammoth Cave. The cave owners relied on a work force of approximately 70 African American slaves to mine this valuable mineral. Miners collected dirt from various cave passages, loaded it aboard ox-carts and hauled it to leaching vats located both at the Rotunda, the large chamber a short distance from the Historic Entrance, and Booth's Amphitheater, near the entrance to Gothic Avenue (see Map 3). When the vats were filled with dirt, they were flooded with water flowed by gravity from the cave's entrance through wooden pipes. When the water had absorbed the calcium nitrate from the soil, it was drained into troughs beneath the vats. The resulting water and calcium nitrate solution was then siphoned into a collecting tank and pumped by hand through another wooden pipeline back to the entrance. Once at the surface, the solution was leached through wood ashes in vats similar to those used in the cave and finally boiled until saltpeter crystals formed. The crystals were then packed in barrels and shipped to gunpowder manufacturers in the East.

During the mining operation, many curiosities and artifacts from a much earlier time period were recovered from the cave dirt. Artifacts such as cane reed torches and fiber sandals were found. News of these discoveries spread quickly along with stories about the huge size of the cave. It was first called Mammoth Cave on a map produced in 1810 to provide detailed information on the location of the saltpeter deposits within the cave. Certainly the name would suggest the large size of the cave, but also as some scholars suggest, the name might have been chosen to capitalize on a recent discovery of Pleistocene elephant remains that captivated the imagination of much of the public at that time.

When the war ended in 1815, the cave's owners could no longer make a profit mining saltpeter. Still, people who heard about the many discoveries continued to visit the cave to see for themselves the artifacts and the big chambers of this underground marvel. As people published accounts of their visits, the numbers of people who visited the cave grew rapidly.

**Exciting Discoveries and a Notable Failure**

In 1839 Mammoth Cave was purchased by Louisville, Kentucky, physician Dr. John Croghan. Many trails had been mapped by visitors, but Dr. Croghan improved the trails to make it easier for people to walk through the explored sections of the cave. Croghan also bought and improved a nearby hotel to encourage visitors. From the cave's previous owner, Franklin Gorin, he purchased the services of three individuals--the young slaves Stephen Bishop and brothers Matt and Nick Bransford--to work as guides.

Stephen Bishop proved to be an excellent explorer as well as guide. He made many of the great discoveries that increased the cave's fame over the next decade. He was reportedly the first person to cross the "Bottomless Pit," which plunged more than 100 feet below the cave trail, into the darkness beyond the light provided by lard oil lanterns. Bishop became one of the most celebrated guides in Mammoth Cave's history, and his services were requested by nearly everyone who visited the cave before he died in 1857. His much publicized discoveries reported in the guidebook Rambles in the Mammoth Cave ensured that the cave would be a destination for millions of people from all over the world.

As well as wanting to learn the extent of the cave, Dr. Croghan was curious about its possible healing qualities. He believed that the cave's constant temperature and humidity might prove healthy for those suffering from consumption, a disease known today as tuberculosis. In the spring of 1842 he allowed patients suffering from the disease to live in wooden and stone huts constructed along the main avenues of the cave. Visitors during this experiment reported hearing constant coughing from the patients who appeared as pale, skeleton-like figures inside the huts. In 1843 the experiment ended in failure. Several patients died in the cave and many others grew more sickly. It seemed the high humidity in the cave and the cool temperatures harmed rather than helped the patients. Even so, Croghan's experiment added much to the medical profession's knowledge of tuberculosis and, by process of elimination, helped lead the way for control of the disease. The two remaining stone huts in the cave today are a haunting reminder of Dr. Croghan's experiment. Ironically, Dr. Croghan himself died of the dreaded disease in 1849.

After Dr. Croghan's death, his nieces and nephews acted as trustees of Mammoth Cave until the last heir died in 1926. According to his will, at the death of his last heir Mammoth Cave would be sold at public auction. During that three-quarters of a century developments in transportation--a Mammoth Cave spur line railroad and early automobiles--increased the number of visitors. It also brought increased competition to

Mammoth Cave by the nearby owners of land which lay over some smaller caves. By the mid-1920s the area was in the middle of what historians call the "Cave Wars." This period was characterized by exaggerated advertising claims and outright deception about what visitors could see in the various other caves. Many cave owners allowed people to think that they were visiting Mammoth Cave when in fact they were in another cave.

**Questions for Reading 2**

1. What mineral was mined in Mammoth Cave during the War of 1812? Why was it important to the country? Who performed the labor?

2. Imagine yourself as the owner of the cave in 1815. How would you use it to make a living?

3. Who was Stephen Bishop and why was he important to the cave's history? Why is it significant that Bishop reached this notoriety during the 19th century?

4. What did Dr. Croghan plan to do with the cave when he bought it in 1839? Describe his medical experiment. What does it tell you about medical science of the time?

*Reading 2 was compiled from Guy Prentice, Archeological Overview and Assessment of Mammoth Cave National Park (Tallahassee, Fla.: Southeast Archeological Service, National Park Service, 1991); Marsha A. Mullin, "Mammoth Cave Saltpeter Works," Historic American Engineering Record No. KY-18, Washington, D.C.: U.S. Department of the Interior, National Park Service, 1986; and Kelly A. Lally and Bruce J. Noble, Jr., "Mammoth Cave National Park Historic Resource Study" (Edmonson County, Kentucky) National Register of Historic Places Multiple Property Documentation Form, Washington, D.C.: U.S. Department of the Interior, National Park Service, 1991.*

# Determining the Facts
# Reading 3: For Future Generations

**Dr. Croghan's Will and Plans for a National Park**

The death of the last heir of Dr. Croghan in 1926 coincided with a movement to establish more national parks east of the Mississippi River, closer to the country's more populated areas. Mammoth Cave seemed an obvious candidate for park status and had support within the state. The project to make it into a park proved difficult, however, because unlike the vast lands included in western parks such as Yellowstone and Yosemite, the area around Mammoth Cave had become populated with small farms and local businesses. More than 600 families called the would-be park home, and many of these families had been among the area's first settlers. Many of them did not want to leave their land and opposed the establishment of a park.

At the same time, many knowledgeable people feared that if Mammoth Cave were sold at public auction it could be divided up and might quickly be destroyed. They believed that the only way to ensure protection of the cave for future generations was to have it declared a national park. Congress agreed. President Calvin Coolidge signed the legislation creating Mammoth Cave National Park on May 25, 1926. The act made the creation of the park dependent on the donation of the land to the federal government. The act recognized the role to be played by the Mammoth Cave National Park Association, which was formed in 1924 by area citizens interested in promoting Mammoth Cave as a national park.

Statewide leaders from Kentucky supported the efforts because attracting more visitors to Kentucky benefited the state's economy. In 1928 the state legislature created the Kentucky National Park Commission to help acquire the land. It took until 1941 for sufficient land to be purchased and donated to the National Park Service for the area to be designated a national park.

The struggle to acquire the land was at times a sad and bitter process. Most of the landowners were farmers who were barely making a living. After the Great Depression struck, many of these poor people were forced to think about leaving their farms to earn money elsewhere. This would mean abandoning property that had been in their family for generations. For a few, pride of ownership and family heritage were so strong that they would rather live in poverty than move.

The National Park Service's vision for Mammoth Cave National Park was in conflict with those feelings. As with other national parks at the time, Mammoth Cave would be protected as a large natural area without signs of human use, such as buildings. The commission used laws to force people to sell their land, which would become Mammoth Cave National Park. Some of those owners were happy to be able to sell the

unproductive farmland to the government; a few even donated some of their acreage. Others fought the commission to hold onto the place they knew as home.

Over time, the commission obtained deed to the land and razed farmhouses, barns, schools, and other buildings. Exceptions were made only for some church property. Even though the congregations would no longer live nearby, the church grounds continued to be important to many people. For example, there are more than 70 cemeteries within park borders, many of which are still open for the burials of people who have relatives already buried there.

Joppa Church and its cemetery is one of only three remaining church buildings with adjoining cemeteries located in the park. In 1990 Mrs. Lydia Minyard, a local citizen, was asked to describe her feelings about the Joppa Church--the one she had attended all her life. She said that when she approached the old church she felt like she was "a few steps closer to heaven." She added that her husband and little boy were buried in the church cemetery and she looked forward to the day when she would join them. In the spring of 1993, Mrs. Minyard was laid to rest in the family plot only a short distance from the church of which she spoke so fondly.

Like the American Indians who originally inhabited the land, the descendants of the European settlers who arrived in the Green River Valley in the 1790s also were displaced from land that had belonged to their families for a long time. As a national park, the land now belongs to all Americans and must be protected for their benefit and enjoyment for all time.

Just like the decisions made in the past about the management of Mammoth Cave National Park, decisions made today about land and resources in our own communities will affect not only the resources themselves, but also their ability to enrich the quality of life we derive from them.

**Questions for Reading 3**

1. Why did people want Mammoth Cave to become a national park?

2. Why was it important to obtain single ownership of the Mammoth Cave area? How would you feel if you had to leave your home so that a park could be created?

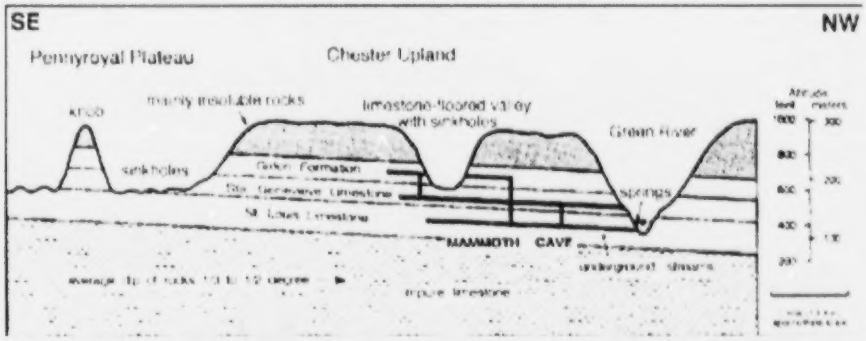
3. How was the land acquired?

4. What buildings were left in the region after the park was established? Why were those building spared when others were not?

*Reading 3 was compiled from Kelly A. Lally, "Joppa Baptist Church and Cemetery" (Edmonson County, Kentucky) National Register of Historic Places Registration Form, Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989; Cecil E. Goode, World Wonder Saved: How Mammoth Cave Became a National Park (Mammoth Cave, Ky.: The Mammoth Cave National Park Association, 1986); and Lynwood Montell, Oral History Tapes, Mammoth Cave National Park, 1994.*

# Visual Evidence

## **Drawing 1:** Diagram 1: Cross section through Mammoth Cave.




*(Adapted, with permission, from Arthur N. Palmer, A Geological Guide to Mammoth Cave National Park, 1981)*

**Questions for Diagram 1**

1. Examine Diagram 1 which shows a number of important geological features found in the park and surrounding area that are key to understanding the formation of caves. Does the diagram help you to better understand how caves are formed? What key element in the formation of Mammoth Cave can you observe in this diagram that would not be evident in a surface map?

2. Explain the role underground streams play in the formation of caves. In the Mammoth Cave area, the dip of the rock layers, as indicated in the diagram, causes these underground streams to flow from the sinkholes in the Pennyroyal Plateau through the Chester Upland and into the Green River.

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# Visual Evidence
# Drawing 1: Saltpeter mining operation at Mammoth Cave, c. 1810-1815.

*(Delineated by Dan Ellingson, 1986. Historic American Engineering Record, National Park Service)*

**Questions for Drawing 1**

1. Based on what you learned in Reading 2, describe what is happening in this drawing.

2. Make a list of the pros and cons of working in a cave. What do you think it would be like? Is this an environment you would enjoy working in? Why or why not?

3. Why was saltpeter mining important in the early 19th century? Why did this mining operation become unprofitable?

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# Visual Evidence
# Photo 1: Modern View of Green River Valley Showing Natural Reforestation

*(Mammoth Cave National Park)*

# Visual Evidence
# Photo 2: Historical photo of farm field showing typical land use prior to park establishment, c. 1935.

*(Mammoth Cave National Park)*

**Questions for Photos 1 & 2**

1. Examine Photo 1 showing part of the Green River Valley as it appears today and might have appeared at the time of European settlement. Would you suspect that an enormous cave lay underground? Why might people would want to settle on this land?

2. Look at Photo 2. This is a typical view of the land after it had been farmed for several generations. How do you think the trees grew up on the land that had once been plowed for crops? Do you think more kinds of plants and animals live in the park now or when it was farmland?

3. What do you think are the most important benefits we receive from wild or natural areas? What are the most important benefits we receive from farmland? How can we balance the need for both types of land?

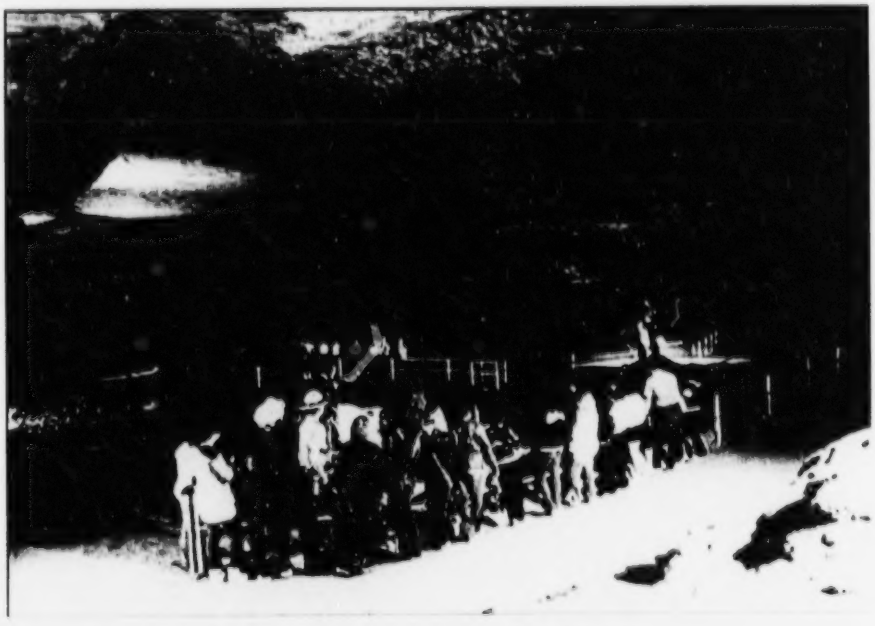
4. If you were among those who had to move out of the area, would you have approved or disapproved of the establishment of the park?

# Visual Evidence

## Photo 3: Visitors pose with their guide, c. 1900.

*(Mammoth Cave National Park)*

## Photo 4: Modern day visitors in a cave passageway.



**Questions for Photos 3 & 4**

1. Examine Photo 3. These cave visitors are wearing "cave costumes." Why do you think early visitors to the cave wore "costumes" during their tour?

2. What type of lights has the guide in Photo 3 spread on the ground?

3. Examine Photo 4 of the modern day visitors. How might visiting the cave today differ from visiting it in the 19th and early 20th centuries?

4. Would visitors today still need cave costumes? Why or why not?

# Putting It All Together

The following exercises encourage students to better understand Mammoth Cave and appreciate local natural and historic resources.

**Activity 1: Touring Mammoth Cave**

Have students pretend they were one of the people who made an actual tour of the cave with Bishop in 1848. They are to write a letter to a friend describing Mammoth Cave and their experience on the tour. They may use a standard encyclopedia to obtain additional information about Mammoth Cave. Have students compare their letters and discuss the need for guides when touring potentially dangerous places.

**Activity 2: Caring for Local Resources**

Have students list some of the places in their community or region that are visited by tourists or are of special interest to the inhabitants of the community. They might start the list by thinking of school field trips they have taken. Then ask students to name one of their community's established natural or historic resources. This is a place which is felt to be so important that it must be specially cared for to ensure that it will exist for future citizens. Have students investigate how preservation of that site is funded. Working in small groups, ask students to identify another site, one that they think ought to be preserved, but which is not yet protected. Have the groups devise a conservation plan for their site.

**Activity 3: Luring the Public to a Special Place**

Mammoth Cave's most striking feature is its vast, incomprehensible size. From the earliest times it drew visitors who ranged from those who wanted to explore its total extent to those who simply wanted to gaze at some of its incredible natural formations. It is easy to see why tourists were drawn to this remarkable natural property, and why the Kentucky National Park Commission hoped to keep them coming. Ask students if any of the natural or historic features on the list they generated for Activity 2 has the potential to draw tourist dollars to the region. Have them investigate state or local agencies that promote tourism. Then they should find out how those agencies describe the area and its resources. After studying existing brochures or taking walking tours, have each student develop an advertisement for the state's natural or historic resource they find most interesting. Have students exchange brochures and discuss the region's attractions. They might find it helpful to visit the state tourism agency or a local chamber of commerce for background information.

# Mammoth Cave: Its Explorers, Miners, Archeologists, and Visitors--
# --Supplementary Resources

By looking at Mammoth Cave: Its Explorers, Miners, Archeologists, and Visitors, students learn about how caves form, what its resources are, and the people who visited the site. Those interested in learning more will find that the Internet offers a variety of interesting materials.

**Mammoth Cave National Park** http://www.nps.gov/maca/home.htm
Mammoth Cave National Park is a unit of the National Park System. Visit the park's web pages to take an 1844 tour of the park, view images of the cave, read about different aspects of the park such as its history, archeology, geology, and much more. Also included on the site is information about the parks designation as a World Heritage Site and an International Biosphere Reserve.

**Park Geology** http://www2.nature.nps.gov/grd/index.htm
The Park Geology web pages provide information on the National Park Service's programs in geology and minerals management. Click on the "Park Geology Tour" link to find information on caves, fossils, sand dunes, glaciers, and much more. Under "Caves" you will find a link to further information regarding Mammoth Cave National Park.

**Library of Congress** http://memory.loc.gov/ammem/amhome.html
Search the American Memory Collection for resources on Mammoth Cave National Park. Most interesting is the Historic American Buildings Survey/Historic American Engineering Record's documentation on Mammoth Cave Saltpeter Works. There are drawings, photos, and pages of documentation in this collection.

**The National Speleological Society (NSS)** http://www.caves.org/
Explore the NSS web pages to learn about this organization that is dedicated to the purpose of advancing the study, conservation, exploration, and knowledge of caves. Click on "Learn About Caves" for detailed information on science topics, a vocabulary/definition list, links to other organizations, and laws dealing with cave protection. Also included on the site are several virtual cave tours.

**U.S. Geological Survey** http://pubs.usgs.gov/gip/geotime/contents.html
The USGS web pages offer an on-line publication titled, "Geologic Time." The publication has essays on Geologic Time, Relative Time Scale, Radiometric Time Scale, and the Age of the Earth. It also provides time lines on Major Divisions of Geologic Time and a Fossils Index.

**Lest We Forget** http://www.coax.net/people/lwf/hrb_sb.htm

Lest We Forget focuses on the history and culture of black Americans and their contributions to the development and growth of the nation. Included on the site is information about Stephen Bishop, an African-American cave explorer.

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